

CHAPTER 3 - AFFECTED ENVIRONMENT

3.0 INTRODUCTION

Construction of the WDNGDP could potentially affect certain critical elements of the human environment, as defined in the BLM Handbook H-1790-1 (NEPA Handbook), Appendix 5, as amended. These elements must, at a minimum, be considered in all EAs developed by the BLM. The status of the critical elements for the WDNGDP are indicated in **Table 3.1**.

Table 3.1 Critical Elements of the Human Environment, WDNGDP

| Element | N/A or Not Present | Applicable or Present, No Impact | Discussed in EA |
|--|--------------------|----------------------------------|-----------------|
| Air Quality | | | X |
| Areas of Critical Environmental Concern (ACEC) | X | | |
| Cultural Resources | | | X |
| Environmental Justice | | | X |
| Farm Lands (Prime or Unique) | X | | |
| Floodplains | X | | |
| Invasive, Non-Native Species | | | X |
| Migratory Birds | | | X |
| Native American Religious Concerns | | | X |
| Threatened or Endangered Species | | | X |
| Wastes, Hazardous or Solid | | | X |
| Water Quality Drinking/Ground | | X | X |
| Wetlands/Riparian Zones | X | | |
| Wild and Scenic Rivers | X | | |
| Wilderness | X | | |

If the resources or value is not present or is not affected by the Proposed Action, this may be documented as a negative declaration. These items will not be discussed further in this EA. In addition to the critical elements, this EA discusses the current status and potential environmental effects from the Project in the areas of geology, minerals, and paleontology, climate and air quality, soils, water resources, vegetation and noxious weeds, range resources, wildlife and special status species, recreation, visual resources, cultural resources, socioeconomics, transportation, health and safety, and noise.

3.1 GEOLOGY, MINERALS, AND PALEONTOLOGY

3.1.1 *Geology*

The Project Area lies within the Great Divide Basin of southwestern Wyoming. The basin is bounded by the Rock Springs Uplift on the southwest, the Wind River Mountains on the north, the Rawlins Uplift on the north and east, and the Wamsutter Arch on the south. The current structural setting was determined during the Laramide Orogeny (Late Cretaceous-Late Eocene) with the creation of the mountain uplifts as sediment sources and the intermontane basins as sediment receptors (Mallory, 1972, pgs. 35-44).

Surface rocks in the area are comprised of brown sandstones, carbonaceous shales, and coal from the Niland Tongue of the Tertiary Wasatch Formation; oil shales, carbonaceous shales, and coal from the Luman Tongue of the Tertiary Green River Formation; dunal sands and loess (including active and dormant dunes) from the Quaternary period; and clay, silt, and fine sand from playa lake and other lacustrine deposits from the Quaternary period. Underlying rocks penetrated by drilling are the Tertiary Fort Union Formation, the Upper Cretaceous Lance Formation, the gas productive Cretaceous Lewis Formation, and the underlying Cretaceous Mesa Verde Group. The latter unit is subdivided in the Project Area into the Almond Formation, Ericson Sandstone, Rock Springs Formation, and Blair Formation, in descending order. Virtually all of the subsurface rocks are composed of lenticular, discontinuous sand and shale units deposited in fluvial to marine marginal environments.

Rock units below the Upper Cretaceous would not be penetrated by WDNGDP drilling, and they are not discussed further in this EA. A stratigraphic column illustrating the Project Area Tertiary and Upper Cretaceous rock units is indicated in **Figure 3.1**.

3.1.2 Mineral Resources

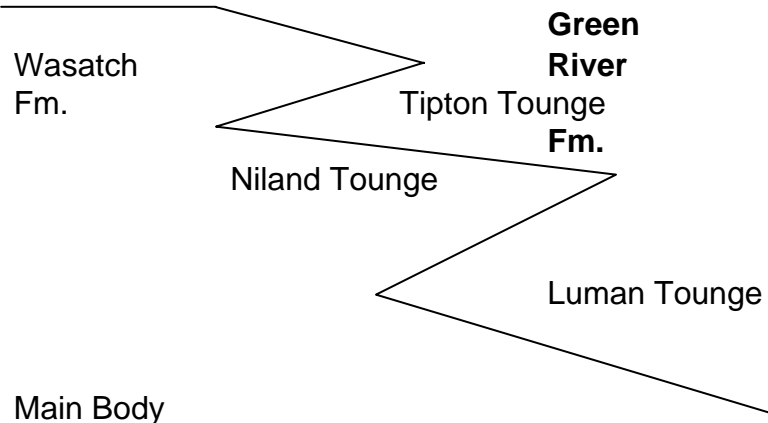
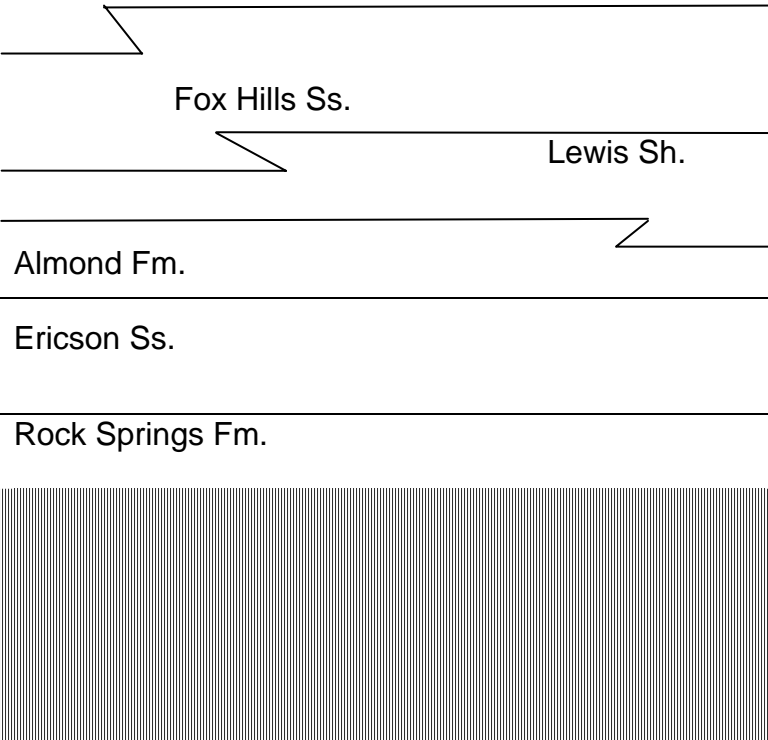
Mineral resources with proven economic reserves known at this time are limited to gas and condensate. All of the Upper Cretaceous units noted above are known to be productive within the vicinity of the Project Area. There are currently five producing wells located within the Project Area. WOGCC data (WOGCC, 2004, online data) indicate that 61 wells have been completed in the Hay Reservoir field which immediately adjoins the Project Area to the west. Production at Hay Reservoir is from the Almond, Lance, Lewis and Mesaverde formations, the same horizons targeted by the Proposed Action.

Although underlain by coal-bearing strata, the Project Area is not within an area with coal development potential (BLM, 1987, Map 24). Uranium is present north and east of the study area, but is not known to exist within the Project Area (BLM, 1987, Map 27). Potentially commercial aggregate materials are located in alluvial deposits to the north of the Project Area (Harris, 1996) and sodium sulfate deposits have been located in the Lost Creek Lake area immediately east of the Project Area (Harris et al., 1985). Oil and gas development does not preclude development of other minerals if they should be determined to be economically significant in the future. There is no other known economically significant mineral resource in the area.

3.1.3 Geological Hazards

There are no known significant geological hazards in the Project Area (Case, 1986; Case, 1986a; Case, 1997; Case and Boyd, 1987; Case and Green, 2000; Newman, 2004, personal communication).

Figure 3.1 Stratigraphic Column, WDNGDP Area

| Period | Formations | Project Area Production |
|-------------------------|--|-------------------------|
| Tertiary |  | |
| | Main Body | |
| Upper Cretaceous | Ft. Union Formation | |
| | Lance Fm. | |
| |  | |
| | Fox Hills Ss. | |
| | Lewis Sh. | |
| | Almond Fm. | |
| | Ericson Ss. | |
| | Rock Springs Fm. | |

Source: Love and Christiansen, 1985, as modified from McMillen and Winn, 1991

3.1.2 Paleontologic Resources

Surface formations in the Project Area are composed primarily the Niland Tongue of the Wasatch Formation and, in the southwest portion of the Project Area, the Luman Tongue of the Green River Formation, both of Eocene age (Love and Christiansen, 1985). No significant paleontological resources have been identified within the areas of potential disturbance (BLM, 2003).

The BLM is cooperating with the USFS Rocky Mountain Region and the University of Wyoming in an experimental program to classify geological formations according to their probability of containing vertebrate fossil resources. The classification system is being developed by the Paleontology Center for Excellence. The paleontological classification system is designed to provide BLM management with a way to prioritize protection of paleontological resources. The program has resulted in the development of the Probable Fossil Yield Classification (PFYC) system. The objective of the program is to develop a predictive model that will better focus agency management activities and budgets for protection of paleontological resources. Under this system, surficial formations are classified on a scale of 1 (lowest) to 5 (highest) to reflect the likelihood of containing vertebrate fossils. Numeric classifications have been developed for both geological formations and individual localities; however, formation rankings determine what formations are investigated in detail. Locality or site rankings provide an indication of the presence of fossils in exposures of a given formation at a specified site.

Under the PFYC classification system, both the Wasatch and Green River formations are ranked as PFYC Class 5 (Newman, 2004, personal communication).

3.2 CLIMATE AND AIR QUALITY

3.2.1 *Climate and Precipitation*

The Project Area lies within the Great Divide Air Basin (BLM, 1987, Map 42), in which the terrain is essentially homogeneous and regional transport is from the southwest throughout the year (Western Regional Climate Center, 2004, online data). The main air quality pollutant is total suspended particulates (TSP). The concentration of pollutants is inversely proportional to wind speed. Wind speed data from Rawlins, on the eastern edge of the air basin, tend to indicate adequate dispersion potential in the Project Area (BLM, 1987, Figure 9). Average annual wind speed in the Rawlins area, located approximately 55 miles east southeast of the Project Area, is approximately 13.6 mph, and average annual precipitation is less than 10 inches (Western Regional Climate Center, 2004, online data). Precipitation data from the nearest station at Wamsutter, approximately 25 miles south, indicates average annual precipitation of approximately 7.5 inches (Curtis and Grimes, 2004, online data).

3.2.2 Air Quality

Air quality modeling has not been conducted within the Project Area. Regional background air quality data, however, suggest that local air quality conditions are well within minimums for both Wyoming Ambient Air Quality Standards (WAAQS) and National Ambient Air Quality Standards (NAAQS). The area is characterized by few emission sources and good atmospheric dispersion conditions (BLM, 2003a, pg. 3-14). With respect to classification in terms of Prevention of Significant Deterioration (PSD) of air quality values, the Project Area is a Class II area. A summary of some regional criteria pollutant background levels is indicated in **Table 3.2**.

Table 3.2 Regional Air Pollutant Background Concentrations and State and Federal Ambient Air Quality Standards, WDNGDP

| Pollutant/Averaging Time | Measured Background Concentration | State and National Ambient Air Quality Standards |
|---|-----------------------------------|--|
| Carbon Monoxide (CO) 1 | | |
| 1-hour | 3,336 | 40,000 |
| 8-hour | 1,381 | 10,000 |
| Nitrogen dioxide (NO ₂) 2 | | |
| Annual | 3.4 | 100 |
| Ozone 3 | | |
| 1-hour | 169 | 235 |
| 8-hour | 147 | 157 |
| Particulate Matter (PM ₁₀) 4 | | |
| 24-Hour | 47 | 150 |
| Annual | 16 | 50 |
| Particulate Matter (PM _{2.5}) 4 | | |
| 24-Hour | 15 | 65 |
| Annual | 5 | 15 |
| Sulfur dioxide (SO ₂) 5 | | |
| 3-hour (National) | 132 | 1,300 |
| 24-hour (National) | 43 | 365 |
| 24-hour (Wyoming) | 43 | 260 |
| Annual (National) | 9 | 80 |
| Annual (Wyoming) | 9 | 60 |

1. Background data collected by Amoco at Ryckman Creek for an 8-month period during 1978-1979, summarized in the Riley Ridge EIS (BLM, 1983).
2. Background data collected at Green River Basin Visibility Study site, Green River, Wyoming, during period January-December 2001 (ARS, 2002).
3. Background data collected at Green River Basin Visibility Study site, Green River, Wyoming, during period June 10, 1998 through December 31, 2001 (ARS, 2002).
4. Background data collected by WDEQ-AQD at Emerson Building, Cheyenne, Wyoming, Year 2002.
5. Background data collected at LaBarge Study Area the Northwest Pipeline Craven Creek Site 1982-1983.

Source: Environmental Assessment for the Atlantic Rim Coalbed Methane Project, Brown Cow POD, Carbon Co., Wyoming.

3.3 SOILS

3.3.1 Soil Types within the WDNGDP Area

Soils within the Project Area are forming in mostly residual sandy materials weathering from the sandstones and shales of the Wasatch and Green River formations (Love and Christiansen, 1985) within the Great Divide Basin of southwestern Wyoming. Limited areas of alluvium and aeolian deposits occupy some of the drainage bottoms in the mostly rolling topography of the Project Area. Soils mapping compiled in the STATSGO data based (NRCS, 1995) identifies four mapping units within the boundaries of the WDNGDP (Table 3.4).

Table 3.3 STATSGO Soil Information, WDNGDP

| STATSGO Unit ID | Unit Name | Location | WDNGDP Area (Acres) | % Area |
|-----------------|---------------------------|---------------------------|---------------------|--------|
| WY 139 | Huguston-Teagulf-Wint | Central Project Area | 4,328 | 67.5% |
| WY 166 | Forelle-Vonason-Farson | Northeastern Project Area | 717 | 11.2% |
| WY 170 | Dines-Fluents-Chrisman | Northwestern Project Area | 778 | 12.1% |
| WY 173 | Dune Land-Cotopaxi-Terada | Southeastern Project Area | 590 | 9.2% |
| TOTAL | | | 6,413 | 100.0% |

All field development activities associated with the proposed wells and ancillary facilities, such as roads and pipelines, would occur within soil mapping unit WY139 with the exception of one proposed well that is situated within WY170. The remaining description of soils will focus on soil characteristics of those soils comprising map unit WY139 and WY170 based on STATSGO data (NRCS, 1995).

The dominant upland soils are predominately fine sandy loam to loam surface soils over bedrock to loamy subsoils that are shallow to moderately deep and well drained. Slopes range from gently sloping (3 percent) to steep (30 percent) with some isolated rock outcrops supporting very steep slopes (75 percent). The remaining mostly upland soils, occupying lower slopes, range from fine sandy loam to loam surface soils over fine sand to sandy clay loam subsoils that are moderately deep to deep and well drained. Slopes range from level (0 percent) to sloping (6 percent).

The potential for accelerated soil water erosion and soil loss is limited to the mostly shallow to moderately deep soils of the steeper slopes (generally greater than 15 percent). Areas with slopes in excess of 15 percent represent approximately 5 to 10 percent of the Project Area. The potential for wind erosion is mostly moderate for the soils in the Project Area with the exception of the fine sandy soils forming in the limited aeolian deposits which make up about 5 percent of the Project Area.

Rogrube soils likely occupy the bottoms of the larger drainages and closed playas in the Project Area. These loamy soils comprise approximately 5 percent of the Project Area and have elevated salinity (4 to 8 mmhos/cm) and sodic (SAR) (5 to 8) levels in surface and subsoil

horizons (NRCS, 1995). Surface horizon values for salinity and SAR range from 0 to 4 mmhos/cm (non-saline to slightly saline) and 2 to 5 (SAR values), respectively. Neither range of values for the surface horizon would pose limitations on vegetative productivity (BLM, 2003d).

3.4 WATER RESOURCES

Historical precipitation for the study area is reported by the National Weather Service Oceanic and Atmospheric Administration (NOAA) weather stations at Wamsutter, Bitter Creek, South Pass, and Sand Draw, Wyoming. These recording gauges surround the Project Area. The gauge elevations average is 7,243 feet above mean sea level. The average annual precipitation data for the gauges are: Wamsutter, 7.4 inches; Bitter Creek, 6.7 inches; South Pass, 14.1 inches; and Sand Draw, 9.66 inches. The reading at Wamsutter is the most representative for the Project Area. The winter period (November 15 through April 30) accounts for approximately 20 percent of the average annual precipitation. Average annual pan evaporation (Seminole Dam, Carbon County) is 36.21 inches (Western Regional Climate Center, 2004, online data).

3.4.1 Surface Water

The Project Area is located within the Great Divide Basin physiographic province which is internally drained. Red Creek, which flows south from Cyclone Rim and Honeycomb Buttes into Hay Reservoir, just grazes the northwestern portion of the Project Area. The eastern portions of the Project Area are drained by two unnamed easterly-flowing tributaries to the Lost Creek Lake, a dry lakebed. All streams in the vicinity are ephemeral, flowing only in response to runoff. Due to the current drought conditions and extremely dry conditions in this basin, the limited run-off seeps into the ground and/or evaporates almost immediately.

Hay Reservoir is located southwest of the Project Area. The dam for the reservoir is on private land and in the past the dam had been maintained by ranchers, but washed out many years ago. The current landowner in recent years repaired the dam and the reservoir is again functional, holding water during runoff periods (Bargsten, 2004, personal communication).

3.4.2 Groundwater

Groundwater aquifers in the area are principally lower Tertiary, primarily Wasatch and Ft. Union Formations, although deeper aquifers in Upper Cretaceous sandstone units are known to exist. Aquifers within the Great Divide Basin comprise a portion of the Upper Colorado River Basin regional aquifer system.

Permeability of the lower Tertiary aquifers is variable and somewhat dependent on the degree of secondary porosity. The upper part of the Wasatch aquifer interfingers with shales and mudstones of the overlying Green River Formation, and portions of these units form the surface within the Project Area. The Wasatch-Ft. Union aquifer is commonly confined and artesian flows are common. Most of the freshwater within the Upper Colorado River Basin regional aquifer system is contained within the Wasatch and Ft. Union formations. The combined thickness of the two contiguous units is approximately 7,000 feet near the center of the Great Divide Basin.

Potentiometric surface mapping of the Wasatch-Ft. Union aquifer indicates that groundwater flow is generally towards the center of the Great Divide Basin. A local depression of the surface in northeastern Sweetwater County is the result of extensive groundwater withdrawals. Estimated depth to groundwater is generally less than 200 feet in the vicinity of the Project Area (USGS, 1996, pg. I-19).

Sandstone units within the Upper Cretaceous Mesaverde Group comprise the Mesaverde aquifer. Shales may form locally confined units, but in general the Mesaverde exists in hydraulic continuity with the overlying lower Tertiary aquifers. The Mesaverde, in turn, is hydraulically separated from underlying aquifers by thick, confining Lower Cretaceous shale formations. The Mesaverde is exposed around the margins of the Rock Springs Uplift, and relatively fresh water may extend a limited distance down dip. Groundwater flow is toward the central portion of the Great Divide Basin. In the deeper portions of the basin, the formation's groundwater tends to be saline or briny. In the vicinity of the Project Area, regional salinity, as measured by Total Dissolved Solids (TDS) values, are in the range of 3,000-10,000 mg/l (USGS, 1996, pg. I-19).

The online database of the Wyoming State Engineer's Office (WSEO) was searched for water well locations within one mile of the Project Area. Three permits were located: P55110W, BLM, SWNE of Section 18, T24N, R96W; P155774, William Jolley and BLM, NWSE of Section 5, T23N, R96W; P46934W, Davis Oil and BLM, NWSE Section 5, T23N, R96W. The latter permit is abandoned.

Data from the WSEO for the above and nearby wells with both active and voided water rights suggest that the shallow Wasatch aquifer is reached with wells of generally less than 500 feet depth. Static water levels typically ranged from 100 to 400 feet, but have been found as shallow as 30 feet. Actual yields from the shallow aquifer typically ranged from approximately 20 gallons per minute (gpm) to approximately 70 gpm. Wells in Section 36, T24N, R97W in the vicinity of the Hay Reservoir produced from a deeper Wasatch/Ft. Union aquifer at depths of approximately 3,200 feet to 5,200 feet. Artesian flow was observed with rates up to 225 gpm. Wells with currently valid permits near the Project Area are principally used for stock watering (WSEO, 2004, online data).

A summary of characteristics of potential aquifers within the Project Area is indicated in **Table 3.4**.

Table 3.4 Water-Bearing Characteristics of Some Formations, WDN GDP Area

| Formation | Approximate Depth, | Characteristics |
|-----------|--------------------|-----------------------------------|
| Wasatch | Surface | Flows to 250 gpm, TDS < 2,800 ppm |
| Ft. Union | 4,400 | Flows to 300 gpm, TDS < 3,350 ppm |
| Lewis | 10,600 | Sands may have artesian flows |
| Almond | 11,300 | Flows to 100 gpm, TDS < 1,500 ppm |

Source: BLM, Rawlins Field Office

The region surrounding the study area contains local areas of spring discharges, but the Project Area is located in an area of groundwater recharge.

Water produced in association with gas and condensate production in the Wind Dancer Unit, is stored in on-site tanks prior to trucking to an approved disposal facility not located on BLM surface. Water production averages less than 5 bbls per day per well. No produced water is discharged to water courses or to the surface in the Project Area. Quality of the produced water exhibits TDS ranges from approximately 256 ppm to approximately 14,000 ppm, depending upon productive horizon.

3.5 VEGETATION, WETLANDS, AND NOXIOUS WEEDS

3.5.1 Vegetation Cover Types

Vegetative cover in the Project Area is representative of the semi-arid Wyoming Basin floristic region, where precipitation and soil parent material are controlling factors for plant composition. Vegetation may be sparse in areas. Cover of the Project Area is a mix of vegetation types typical of the basins of south-central Wyoming and is dominated by plant species that are drought tolerant: big sage, black sagebrush, rabbitbrush, winterfat, shadscale saltbush, gardner saltbush, horsebrush, spiny hopsage, greasewood, bud sage, mustard, buckwheat, phlox, purple aster, paintbrush, cactus, thickspike wheatgrass, needle and thread, squirreltail, bluegrass, Indian and contracted ricegrass. The percent composition of major vegetation types within the Project Area is presented in Table 3.5.

Table 3.5 Type and Relative Amounts of Vegetation within the WDNGDP Area

| Type | Relative Amount of Vegetation |
|------------|-------------------------------|
| Grassland | 60% |
| Sagebrush | 15% |
| Saltbush | 10% |
| Greasewood | 15% |

* Percentages are approximations from a recent on-site survey and from the Hay Reservoir EA (BLM, 1992).

3.5.1.1 Grassland Type

Within the Project Area, grasslands make up approximately 60 percent of the vegetative cover. The major grass species comprising this type are Indian ricegrass (*Oryzopsis hymenoides*), needle-and-thread (*Stipa comata*), bluebunch wheatgrass (*Agropyron spicatum*), western wheatgrass (*Agropyron smithii*), and thickspike wheatgrass (*Agropyron dasystachyum*) (BLM, 1992).

3.5.1.2 Sagebrush Type

Big sagebrush (*Artemisia tridentate*) is the most common constituent of the sagebrush type. Predominant subtypes include black sagebrush (*Artemisia nova*), bud sagebrush (*Artemisia spinescens*), Douglas rabbitbrush (*Chrysothamnus vicidiflorus*), and rubber rabbitbrush (*Chrysothamnus nauseous*) (BLM, 1992).

3.5.1.3 Saltbush Type

The dominant shrub is Gardener saltbush (*Atriplex nuttallii*) with shadscale saltbush (*Atriplex confertifolia*) and winterfat (*Ceratoides lanata*) common at some locations. Understory species include bluegrass (*Poa spp.*), bottlebrush squirreltail (*Sitanion hystrix*), Indian ricegrass, Phlox, and summer cypress (*Kochia Americana*) (BLM, 1992).

3.5.1.4 Greasewood Type

This type is normally located in narrow gulches and low flats which are heavily impregnated with alkali. Shrubs dominate the composition of this vegetation type. The dominant shrub is the greasewood (*Sarcobatus vermiculatus*) with rabbitbrush and saltbush common in the overstory. Bottlebrush squirreltail, foxtail barley (*Hordeum jubatum*), and summer cypress are common in the understory. Halogeton (*Halogeton glomeratus*), usually considered a weed, is also present (BLM, 1992).

3.5.2 Wetlands and Riparian Areas

The Wind Dancer Unit does not contain any wetland or Riparian areas. The Hay Reservoir area to the west of the Project Area supports riparian areas but lies outside of the Project Area.

3.5.3 Invasive/Noxious Weeds

Increased occurrences of non-native invasive species, as well as those noxious weeds defined by Wyoming Statutes (WS 11-5-102.a.xi) as "the weeds, seeds or other plant parts that are considered detrimental, destructive, injurious or poisonous, either by virtue of their direct effect or as carriers of diseases or parasites that exist within this state, and are on the designated list" (National Agricultural Library, 2004, online data) may accompany oil and gas development. Wyoming statute has designated 23 species of noxious weed. In addition, under authority of the Wyoming Weed and Pest Control Act of 1973 (WS 11-5-119), counties may designate additional weeds of concern.

The Project Area has the potential for the following State-designated noxious weeds:

- ∄ hoary cress
- ∄ Russian knapweed
- ∄ Canada thistle
- ∄ perennial pepperweed (wet areas)

A Sweetwater county weed of concern is black henbane, which may possibly occur along roads and ditches (Cotterman, 2004, personal communication).

3.6 RANGE RESOURCES AND OTHER LAND USES

Livestock management operations and oil and gas extraction characterize the major land uses in the Project Area.

3.6.1 Range Resources

Due to arid conditions and limited water resources, livestock grazing of federal lands represents the primary form of agriculture in the WDGNP. Federal allotment 10103, Cyclone Rim, includes the entire WDGNP (BLM, 2003). Seasons of use are winter (cattle and sheep) and summer (cattle). Primary use is for cattle during the summer. Estimated carrying capacity in the area is 9 to 11 acres per Animal Unit Month (AUM).

3.6.2 Other Land Uses

The Project Area is comprised of approximately 6,400 acres of federal, BLM-administered lands. No state or private lands are present in the Project Area. Other land uses within and adjacent to the Project Area, in addition to livestock grazing, are wildlife habitat, oil and gas exploration, development and transmission, and dispersed recreation.

Conventional oil and gas resources have been developed in and around the WDGNP. Five wells have been drilled in the Project Area; four are currently in production, and one is being re-drilled. Approximately 55 acres have been disturbed by previous oil and gas development in the Project Area.

3.7 WILDLIFE AND FISHERIES

3.7.1 General Wildlife

Mammals found in the vicinity of the Project Area include jackrabbit (*Lepus spp.*), cottontail rabbit (*Sylvilagus spp.*), coyote (*Canis latrans*), Richardson's ground squirrel (*Spermophilus richardsonii*), thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*), badger (*Taxidea taxus*), and various mice. Areas of tall (> 4 feet) sagebrush along drainages serve as wildlife corridors, providing hiding cover from predators as well as thermal shelter for wintering wildlife. White-tailed prairie dogs (*Cynomys leucurus*), a BLM sensitive species, is known from sagebrush plain areas (BLM, 1987; Whitaker, 1992).

Local bird species include horned lark (*Eremophila alpestris*), sage thrasher (*Oreoscoptes montanus*), mourning dove (*Zenaida macroura*), and common raven (*Corvus coras*). Small stock ponds in the vicinity of and immediately southwest of the Project Area and Hay Reservoir provide water for migratory waterfowl.

3.7.2 Big Game

Most of the Project Area is habitat for pronghorn (*Antilocapra americana*) and mule deer (*Odocoileus hemionus*). The combination of hills, rough breaks, draw and flats provide a mixture of microhabitat sites in terms of snow depth, exposure to wind, sun and forage availability. This is a dynamic system, as snow falls and then moves across the topography in response to the wind. Antelope and deer move around throughout the winter in response to weather conditions and the protection provided by these microhabitats. No crucial big game winter range has been identified within the Project Area (BLM, 1987, pg. 43).

Wyoming Game and Fish Department (WGF) has defined the entire Project Area as winter/year long range for antelope. A portion of the antelope population makes use of the local habitat on a year long basis. During the winter months (December 1 through April 30), the area is host to a significant influx of animals from other seasonal ranges. Antelope in the Project Area belong to WGF herd unit 615 (Red Desert) (WGF, 2002, GIS data). Herd Unit 615 comprises approximately 2.16 million acres. Estimated population counts for this herd unit for 2002 were 14,000 individuals with a target population of 15,000 (WGF, 2003, Lander Region, Red Desert Herd Unit, pgs 2-10).

WGF has defined a spring/summer/fall range for mule deer in an area around Hay Reservoir. A portion of the population frequents this range outside of the winter months (December 1 through April 30). The range around Hay Reservoir extends over approximately 30 percent of the Project Area, in the western and southwestern portions. The defined range forms a rough rectangle about 40 sq. miles in extent, with Hay Reservoir in the northeastern part of the area. Mule deer in the Project Area belong to WGF herd unit 430 (Steamboat) (WGF, 2002, GIS data). Herd Unit 430 comprises approximately 2.5 million acres. Estimated population counts for this herd unit for 2002 were 3,100 individuals with a target population of 4,000 (WGF, 2003, Green River Region, Steamboat Herd Unit, pgs 202-222).

Wyoming Game and Fish observation data from 1986-1991 showed the number of antelope in the Project Area (T24N R96W) to be 239 and mule deer to be 4 (BLM, 1987, pg. 43). Antelope fawn production has been low in the Red Desert Herd Unit for at least ten years. Mule deer population in the Steamboat Herd Unit has grown slowly since 1993, until 2002 when an estimated 10% decline was observed. It is believed this decline is associated with the third year of severe drought in the area (WGF, 2003, Green River and Lander Region Herd Unit reports).

Elk (*Cervus elaphus*) are not commonly found in the study area. Sightings generally occur during hunting season when pressure from that activity tends to drive them from their normal habitat. WGF data indicate habitat within the Project Area is of limited importance to individuals in the area, a portion of herd unit 426 (Steamboat) (WGF, 2002, GIS data). Estimated population counts for this herd unit for 2002 were 1,660 individuals with a target population of 1,200 (WGF, 2003, Green River Region, Steamboat Herd Unit, pgs 270-290).

3.7.3 Wild Horse Management

The wild horse population in the Seven Lakes Herd Management Area (HMA), Great Divide Resource Area, is about 475 horses (BLM, 1987, pg. 42). There are two herds in the vicinity of the Project Area. The Stewart Creek herd is located 16 miles east of the Project Area. The Cyclone Rim herd is north of the Project Area. There is very little mixing of horses between the two herds. A small portion of the Project Area is located in the Great Divide Basin HMA, Green River Resource Area. Rarely do horses use the area in and around the Project Area in either HMA, and use by horses in the Project Area may be considered transient (Bargsten, 2004a, personal communication).

3.7.4 Upland Game Birds

The Project Area is located within sagebrush/grassland habitat common in southwestern Wyoming. The Project Area potentially supports areas of prime habitat for sage grouse (*Centrocercus urophasianus*). Important components of prime habitat for these birds are strutting grounds (leks), nesting grounds, and wintering areas; all of these components potentially occur in the vicinity of the Project Area. Sage grouse is designated a BLM sensitive species and is discussed further in Section 3.8.

3.7.5 Raptors

The Project Area contains habitat suitable for raptors. A number of raptor species, including golden eagles (*Aquila chrysaetos*), northern harriers (*Circus cyaneus*), ferruginous hawks (*Buteo regalis*), Swainson's hawk (*Buteoswainsoni*), prairie falcon (*Falco mexicanus*), and red-tailed hawks (*Buteo jamaicensis*) have been observed in the vicinity of the Project Area.

Raptors are considered sensitive species and are also discussed further in Section 3.8.

3.8 SPECIAL STATUS PLANT, WILDLIFE, AND FISH SPECIES

For the purposes of this EA, special status species are those listed by the Fish and Wildlife Service (USFWS) as threatened, endangered, proposed, or candidate species (USFWS, 2003, online data); or species included on BLM's Wyoming state sensitive species list (BLM, 2002, online data); or on the WGF native status species list (Fertig et al., 1999, online data). Only those species which are known or suspected to occur within the vicinity of the Project Area are discussed.

3.8.1 Threatened, Endangered, Proposed, or Candidate Species

Four federally designated species have the potential to exist within the vicinity of the Project Area, as indicated in **Table 3.5**.

Table 3.6 Threatened and Endangered Species , WDNGDP Area

| Species | Scientific Name | Status |
|----------------------|---------------------------------|------------|
| Plants | | |
| Blowout pestemon | <i>Penstemon haydenii</i> | Endangered |
| Ute Ladies'-tresses | <i>Spiranthes diluvialis</i> | Threatened |
| Mammals | | |
| Black-footed ferrets | <i>Mustela nigripes</i> | Endangered |
| Birds | | |
| Bald eagle | <i>Haliaeetus leucocephalus</i> | Threatened |

Source: BLM, 2003c.

Although no threatened or endangered wildlife species (TES) have been observed in the study area, there is potential for three of these species to occur within the vicinity of the WDNGDP. Bald eagle foraging probably takes place during winter, but this would be on an infrequent opportunistic basis. Bald eagles prefer habitat near water and cliffs or large trees for nesting. No such habitat exists in the area.

Black-footed ferrets have been sited in the vicinity of Wamsutter (approximately 30 miles SE) in 1977, 1978 and 1983. White-tailed prairie dog complexes greater than 200 acres in extent have been observed in the vicinity of the Project Area, indicating the potential presence of black-footed ferret habitat. Large colonies have not been observed within the Project Area. (BLM, 2003c, pgs. 15-16). Although the USFWS has determined that portions of an area that includes the Project Area meet ferret habitat criteria, black-footed ferret surveys are no longer required in this township (Kelly, 2004, letter). However, to protect both potential black-footed ferret habitat and white-tailed prairie dog (a BLM Sensitive Species), the BLM does attempt to avoid impacts to prairie dog towns, which are utilized by mountain plover, burrowing owls, and swift fox.

Two federally listed plant species were identified by the USFWS as potentially present in the general area. Ute Ladies'-tresses (threatened) occurs in seasonally moist soils and wet meadow drainages below 7000 feet elevation. Blowout penstemon (endangered) has been documented along the Killpecker Sand Dunes near Rawlins (BLM, 2003c, pg.17). Habitat for these plants does not occur within the Project Area.

As this is a closed drainage basin and does not contribute to the Colorado River watershed, there would be no impact on Colorado River endangered species.

If, through a biological evaluation, the BLM determines that the Proposed Action may affect a listed species or critical habitat, consultation with the USFWS is required.

3.8.2 Sensitive Species

A number of animal and plant species potentially present in the Project Area have been accorded "sensitive species" status by BLM. Thirty-five of the 78 Wyoming species occur within the boundaries of the Rawlins Field Office (BLM, 2002, online data). Based upon habitat criteria, sensitive species potentially present in the vicinity of the Project Area are indicated in **Table 3.6** (BLM, 2003c, pg. 19).

Table 3.7 BLM Sensitive Species Potentially Found in Vicinity of WDN GDP

| Common Name | Scientific Name | Agency Status | Heritage Program Status * |
|--------------------------|----------------------------------|----------------|---------------------------|
| Birds | | | |
| Ferruginous hawk | <i>Buteo regalis</i> | BLM, FSR2 | Not Listed |
| Western burrowing owl | <i>Athene cunicularia</i> | BLM, FSR2 | G4/S3B,SZN |
| Mountain plover | <i>Charadrius montanus</i> | BLM, FSR2 | G2/S2B,SZN |
| Loggerhead shrike | <i>Lanius ludovicianus</i> | BLM, FSR2 | G5/S4B, SZN |
| Sage Thrasher | <i>Oreoscoptes montanus</i> | BLM | G5/S3B, SZN |
| Baird's sparrow | <i>Ammodramus bairdii</i> | BLM, FSR2 | G5/S3B, SZN |
| Brewer's sparrow | <i>Spizella breweri</i> | BLM, FSR2 | G5/S3B,SZN |
| Grasshopper sparrow | <i>Ammodramus savannarum</i> | WYGF | G5/S3B,SZN |
| Sage sparrow | <i>Amphispiza belli</i> | BLM, FSR2 | G5/S3B,SZN |
| Greater sage grouse | <i>Centrocercus urophasianus</i> | BLM, FSR2 | Not Listed |
| Mammals | | | |
| White-tailed prairie dog | <i>Cynomys leucurus</i> | BLM, FSR2 | G4/S2S3 |
| Swift fox | <i>Vulpes velox</i> | BLM, FSR2, WGF | G3/S2S3 |
| Townsend's big-eared bat | <i>Plecotus townsendii</i> | BLM, FSR2, WGF | G4/S1B,S2N |
| Plants | | | |
| Nelson's milkvetch | <i>Astragalus nelsonianus</i> | BLM | G2/S2 |
| Cedar rim thistle | <i>Cirsium aridum</i> | BLM | G2Q/S2 |
| Gibben's beardtongue | <i>Penstemon gibbensii</i> | BLM | G1/S1 |

* Heritage Program Rankings

FSR2 - Forest Service Region 2 Sensitive Species.

WYND uses a standardized ranking system developed by The Nature Conservancy's Natural Heritage Network to assess the global and statewide conservation status of each plant and animal species, subspecies, and variety. Each taxon is ranked on a scale of 1-5, from highest conservation concern to lowest. Codes are as follows:

G Global rank: Rank refers to the rangewide status of a species.

T Trinomial rank: Rank refers to the rangewide status of a subspecies or variety.

S State rank: Rank refers to the status of the taxon (species or subspecies) in Wyoming. State ranks differ from state to state.

1 Critically imperiled because of extreme rarity (often known from 5 or fewer extant occurrences or very few remaining individuals) or because some factor of a species' life history makes it vulnerable to extinction.

2 Imperiled because of rarity (often known from 6-20 occurrences) or because of factors demonstrably making a species vulnerable to extinction.

3 Rare or local throughout its range or found locally in a restricted range (usually known from 21-100 occurrences).

4 Apparently secure, although the species may be quite rare in parts of its range, especially at the periphery.

5 Demonstrably secure, although the species may be rare in parts of its range, especially at the periphery.

H Known only from historical records. 1950 is the cutoff for plants; 1970 is the cutoff date for animals.

X Believed to be extinct.

A Accidental or vagrant: A taxon that is not known to regularly breed in the state or which appears very infrequently (typically refers to birds and bats).

B Breeding rank: A state rank modifier indicating the status of a migratory species during the breeding season (used mostly for migratory birds and bats).

N Nonbreeding rank: A state rank modifier indicating the status of a migratory species during the non-breeding season (used mostly for migratory birds and bats).

ZN or ZB Taxa that are not of significant concern in Wyoming during breeding (ZB) or non-breeding (ZN) seasons. Such taxa often are not encountered in the same locations from year to year.

U Possibly in peril, but status uncertain; more information is needed.

Q Questions exist regarding the taxonomic validity of a species, subspecies, or variety.

? Questions exist regarding the assigned G, T, or S rank of a taxon.

Western burrowing owls and loggerhead shrikes are summer residents of grasslands and prairie shrub habitat. Furthermore, Western burrowing owls also utilize prairie dog towns as nesting habitat. Sage thrashers and sage sparrows are found in prairie and mountain shrub environments. Brewer's sparrows are summer residents found principally in shrubland habitats. Baird's

sparrows are uncommon summer residents typically found in short-grass prairie locales (Wyoming GAP Analysis, 2001, online data; Udvardy, 1993, BLM, 2002).

Swift fox are fairly common residents occurring over much of Wyoming and will also commonly utilize old prairie dog burrows as den locations. It is a mostly solitary, nocturnal predator. Townsend's big-eared bat is a widely distributed but rare species which forms nursing colonies (Wyoming GAP Analysis, 2001, online data; Whitaker, 1992).

3.8.2.1 Raptors

BLM data show 20 potential raptor nest sites within or adjacent to the Project Area. Ferruginous hawks are particularly common. At least four of the five nests within the Project Area have been identified as belonging to ferruginous hawks.

3.8.2.2 Mountain Plover

Mountain plover was classified as a species proposed for listing by USFWS, but that agency has dropped the species from further consideration. BLM considers this species as sensitive and protective measures continue to apply to actions potentially affecting this species. Much of the Project Area has potential habitat for mountain plover, which is often associated with prairie dog towns.

3.8.2.3 Sage Grouse

BLM records show eight greater sage grouse leks and/or nesting habitat within or in the vicinity of the Project Area. Probable sage grouse habitat is present in the Project Area. Statewide, sage grouse have exhibited a fluctuating, but overall decreasing population trend since WGF began monitoring in 1967. Disruption and fragmentation of sagebrush habitat may be responsible for a part of this decline (Bill Barrett Corporation, 2004, pg. 3-87). The species has also shown a high sensitivity to West Nile virus (Bills, 2004, personal communication). On April 15, 2004, the USFWS announced its intention to initiate a review of the status of the greater sage grouse. The notice initiated a 90-day review to determine whether to propose the species for listing as threatened or endangered.

3.8.4 White-Tailed Prairie Dog

White-tailed prairie dogs inhabit sagebrush plains at higher elevations than those frequented by their black-tailed cousins. White-tailed prairie dogs are less colonial, with only a few of their burrows interlink with those of other individuals (Whitaker, 1992, pg. 411). A white-tailed prairie dog complex was observed in the Project Area during recent onsite inspections (Fetzer, 2004, personal observation).

3.8.5 Sensitive Plant Species

Potential habitat for three sensitive plant species occurs within the Project Area. Nelson's milkvetch occurs in alkaline soils in sparsely vegetated shale slopes and sagebrush communities

between 5,200 and 7,600 feet elevation. Cedar rim thistle occurs on barren chalky and sandy-shaley soils between 6,700 and 7,200 feet. Gibben's beardtongue may be found in habitats similar to cedar rim thistle, but at elevations both slightly lower and higher (BLM, 2002).

3.9 RECREATION

Recreation activities within the Project Area are characterized as dispersed; there are no developed recreational facilities or sites (BLM, 2003). Primary activities in the area include hunting for pronghorn, mule deer, upland game birds, coyotes, and small game. Camping, hiking, wildlife and wild horse viewing, off-road vehicle (ORV) use, and general sightseeing are other recreational opportunities provided in the area inclusive of the Project Area..

3.10 VISUAL RESOURCES

The landscape of the Project Area is rolling sagebrush steppe comprised mostly of grassland and sagebrush vegetation types. The varying level of sagebrush dominance is the major source of natural visual contrast across the area in addition to the mostly rolling terrain and isolated rim areas. The Project Area is mostly free of tall rock outcrops or abrupt breaks in slope. Although natural scenes dominate the area, human intrusions include existing oil and gas wells, bladed and two-track roads, stock ponds, and fences.

The BLM-administered federal lands that comprise all of the Project Area are classified by the BLM using the Visual Resource Management (VRM) System. All lands within the Project Area are classified as Class III (BLM, 1990, map 24). This classification indicates that the grass and sagebrush lands appear moderately altered by oil and gas development and grazing improvements. Additional modifications to the landscape from new activities in the area should be compatible or complementary to the existing scenic character and be moderate in extent

3.11 CULTURAL RESOURCES

Archeological studies of south-central Wyoming indicate that the area has been inhabited by prehistoric peoples for at least 10,000 years. A chronology of the area is indicated in **Table 3.7**.

Table 3.8 Prehistoric Chronology of the Wyoming Basin

| Period | Phase | Age (B.P.) |
|------------------|--------------|-----------------|
| Paleoindian | | 12,000 - 8500 |
| Early Archaic | Great Divide | 8500 - 6500 |
| | Opal | 6500 - 4300 |
| Late Archaic | Pine Spring | 4300 - 2800 |
| | Deadman Wash | 2800-2000/1800 |
| Late Prehistoric | Uinta | 2000/1800 - 650 |
| | Firehole | 650 - 300/250 |
| Protohistoric | | 300/250 - 150 |

Source: BLM (2003a). Based on Metcalf (1987), as modified by Thompson and Pastor (1995).

3.11.1 Previous investigations

For the purpose of documenting all known cultural resource sites and previous Class III cultural resource investigations within the study area, a records search was conducted through the Wyoming State Historic Preservation Office (SHPO) Cultural Records Office (CRO). A total of 11 sections were researched. The 11 sections consist of approximately 7,040 acres largely within the Project Area. The CRO records search results revealed a total of 38 previous Class III cultural resource investigations and seven previously recorded or reported sites. The previous investigations were comprised of both small (well related) block inventories and linear surveys, primarily from pipeline construction. The small block investigations accounted for surface inspection of 210 acres, or approximately 3.3 percent of the entire study area. Acreage inventoried from linear investigations could not be computed from the available information (Davis and others, 2004; Pastor, 2004, personal communication; BLM, 1992, pg. 26).

The sections for which a CRO records search was conducted for the Proposed Action are:

- ∅ T24N, R96W: Sections 14, 15, 16, 17, 18, 19, 20, 21, 22, 27, 28, 29, 30, 31, 32, 33, 34, and 35

There are relatively few sites recorded in relation to the number of previous investigations conducted. When the total number of investigations (38) is divided by the total number of recorded sites (7), it indicates that previous investigations have identified and recorded approximately 0.18 cultural site per survey. It is apparent that the Project Area is one of relatively low site density. Of the seven recorded sites, only two prehistoric open camps in sections 20 (48SW13795) and 29 (48SW15208), had been evaluated as eligible for listing on the National Registry of Historic Places (NRHP) (Davis and others, 2004)..

3.11.2 Site Types To Be Expected

3.11.2.1 Prehistoric

Based on the CRO records search information, and inventories from nearby areas, the most common site type to be expected are those associated with camp/occupation sites. Sites exhibit a variety of activities and manifestations, which may include:

- ∅ camp/occupation sites (i.e. hearths, stone circles and possibly pit houses)
- ∅ food cooking and processing
- ∅ lithic workshops (exhibiting the latter stages of tool manufacture or tool reworking); an abundance of camp related tools (such as manos, metates, pottery, awls, graters and needles)
- ∅ lithic scatter
- ∅ isolated hearths

The CRO records search for the Project Area indicated a total of five prehistoric sites from previous inventories. These included three camps and two sites consisting of lithic scatter. Two

of the camps, as indicated above, were evaluated as eligible for NRHP listing (Davis and others, 2004, Pastor, 2004, personal communication).

Given the relative flatness of the local terrain, all of these cultural site types can be expected in nearly any topographic situation present in the Project Area. Experience in the general area has shown that sites typically cluster along major collection drainages (such as Red Creek), around playa lakes and in select dunal situations. A few sites have been located on exposed ridges, which are generally areas of perceived higher site density.

Other site types which may be present include stone alignments (cairns, circles, and drive lines). These site types are generally found on the crests and upper slopes of ridges, the tops of buttes, and in some other elevated topographic situations.

Stone circles are commonly found throughout Wyoming and adjacent states. Also known as tipi rings, they are often found in association with camp sites and are widely considered to represent weights placed around the bottom of the tipi to keep out wind and cold. Other more isolated stone circles are thought to represent ceremonial or vision quest sites.

If kill sites are present, then it can also be assumed that faunal processing sites are present. Also to be expected are floral processing sites characteristic of the aboriginal hunting and gathering cultures which inhabited this portion of the arid west.

Burial sites, although rare and unlikely, may be present wherever aboriginal peoples were present. Similarly, none of the raw lithic materials preferred for tool manufacture (chert, quartzite, obsidian, basalt or even porcelanite) are available in the geologic formation present in the immediate vicinity, and quarries and large lithic workshop sites are not expected.

3.11.2.2 Historic

Four historic sites were listed by the CRO records search information. The sites consisted of three areas of debris scatter in sections 19 and 22 and one cairn in Section 28. All four sites are considered as ineligible for NRHP listing (Davis and others, 2004; Pastor, 2004, personal communication).

3.11.3 Native American Religious Concerns

Native American resources or religious concerns have not been previously identified in the Project Area. Tribal representatives did not respond to the scoping notice with concerns in this area. The BLM will consult with the tribes at the project-specific level if sensitive sites are identified as a result of the Class III inventory.

3.11.4 Current Investigations

Site-specific Class III Inventory surveys were conducted during April, 2004, on 11 of the proposed Project well pads, access roads, and pipeline ROWs. The Haystack 11 location had been previously surveyed. An inventory was conducted of a 10 acre area centered around each

well pad. Linear access features were surveyed out to 50 feet on either side of the center line. A total of 158.5 acres was surveyed, or approximately 2.4 percent of the Project Area.

Overall, the site density for the Project Area is evaluated as low. The current surveys located two new and one previously identified cultural sites. The previously identified site (48SW15208) and one of the two newly-discovered sites (48SW15278) represent prehistoric open camps. Both are considered eligible for listing on the NRHP. The other newly-discovered site is a historic cairn which is not considered eligible for listing.

3.12 SOCIOECONOMICS

The Project Area occurs in a relatively isolated part of Wyoming, in the heart of the Great Divide Basin. The Project is located in Sweetwater County, close to the borders with Carbon County, on the east, and Fremont County on the north. Principal access is from the south, so it would be Sweetwater and Carbon counties and the communities of Rock Springs, Wamsutter, and Rawlins that may be primarily affected by the Proposed Action.

3.12.1 *Population and Demographics*

Both Sweetwater and Carbon counties are two of the four Wyoming counties which exhibited population declines between 1990 and 2000. Carbon County declined the greatest of any county in Wyoming, 6.1 percent. Sweetwater County's population declined by 3.1 percent. Population figures and trends for the two counties are illustrated in **Table 3.8** (WDAI, 2004, online data).

Table 3.9 Population Trends, WDNDGP Project Vicinity

| County or Town | Population, 1990 | Population, 2000 | % Change |
|-------------------|------------------|------------------|----------|
| Carbon County | 16,659 | 15,639 | -6.1% |
| Rawlins | 9,380 | 8,538 | -9.0% |
| Sweetwater County | 38,823 | 37,613 | -3.1% |
| Rock Springs | 19,050 | 18,708 | -1.8% |
| Wamsutter | 240 | 261 | 8.8% |
| State of Wyoming | 453,588 | 493,782 | 8.9% |

Source: U.S. Census Bureau, retrieved from WDAI (2004).

Carbon and Sweetwater counties, as well as the State of Wyoming, exhibit relatively low ethnic diversity with respect to the rest of the nation. Ethnicity statistics are indicated in **Table 3.9** (U.S. Census Bureau, 2004, online data).

Table 3.10 Population Ethnicity, WDNDGP Project Vicinity, 2000

| Ethnic Group | Carbon County | Sweetwater County | State of Wyoming |
|---|---------------|-------------------|------------------|
| White | 90.1% | 91.6% | 92.1% |
| Black or African American | 0.7% | 0.7% | 0.8% |
| American Indian and Alaskan Native | 1.3% | 1.0% | 2.3% |
| Asian | 0.7% | 0.6% | 0.6% |
| Native Hawaiian and other Pacific Islander | 0.1% | - | 0.1% |
| Other | 5.2% | 3.6% | 2.5% |
| Persons reporting two or more ethnic groups | 2.1% | 2.4% | 1.8% |

| Ethnic Group | Carbon County | Sweetwater County | State of Wyoming |
|--|---------------|-------------------|------------------|
| Hispanic or Latino | 13.8% | 9.4% | 6.4% |
| White, not of Hispanic or Latino origin | 82.4% | 86.9% | 88.9% |
| Language other than English spoken at home | 10.5% | 6.4% | 7.5% |

Source: U.S. Census Bureau (2004).

High school graduates comprise 83.5 percent and 87.4 percent of the Carbon and Sweetwater counties populations, respectively, compared to 87.9 percent for the State of Wyoming. Residents achieving a college Bachelor's degree or higher comprise 17.2 percent and 17.0 percent, respectively for Carbon and Sweetwater counties, compared to 21.9 percent for the State of Wyoming.

3.12.2 Economy, Employment, and Housing

Employment in Carbon and Sweetwater counties is dominated by services, retail trade, mining (including oil and gas development), and local government (including public schools). Only a miniscule fraction of employment is in the farming sector. Non-farm employment by industry sector, and changes over a 10-year period, are indicated in **Table 3.10** (U.S. Census Bureau, 2004, online data; WDOE, 2004, online data).

Table 3.11 Employment by Industry Sector, WDN GDP Vicinity

| Industry Sector | Carbon County | | % Change | Sweetwater County | | % Change |
|---|---------------|-------|----------|-------------------|--------|----------|
| | 1990 | 2000 | | 1990 | 2000 | |
| Total Farm | 538 | 603 | 10.8% | 220 | 205 | -7.3% |
| Total Non-Farm | 9,352 | 9,201 | -1.6% | 22,636 | 24,231 | 6.6% |
| Total Private Sector | 7,203 | 7,164 | -0.5% | 18,607 | 19,964 | 6.8% |
| Agricultural, Services, Forestry, Fishing | 106 | 254 | 58.3% | 81 | 163 | 50.3% |
| Mining (including oil and gas) | 934 | 318 | -193.7% | 4,989 | 3,725 | -33.9% |
| Construction | 515 | 699 | 26.3% | 1,533 | 1,540 | 0.5% |
| Manufacturing | 684 | 625 | -9.4% | 745 | 1,639 | 54.5% |
| Transportation / Utilities | 736 | 615 | -19.7% | 1,987 | 1,809 | -9.8% |
| Wholesale trade | 173 | 180 | 3.9% | 648 | 637 | -1.7% |
| Retail trade | 1,686 | 1,757 | 4.0% | 3,739 | 4,476 | 16.5% |
| Finance / Insurance / Real Estate | 522 | 575 | 9.2% | 1,125 | 1,210 | 7.0% |
| Services | 1,847 | 2,141 | 13.7% | 3,760 | 4,765 | 21.1% |
| Government | 2,149 | 2,037 | -5.5% | 4,029 | 4,267 | 5.6% |

Source: U.S. Census Bureau (2004); WDOE (2004).

For 2002, the unemployment rate for Carbon and Sweetwater counties was 4.6 percent and 4.7 percent, respectively, compared to 4.2 percent for the State of Wyoming.

Mining and oil and gas activity represent fewer jobs than formerly, although the industry continues to be a significant employer in Sweetwater County. Significant losses in jobs from the mining and oil and gas sector have been offset by increases in services, retail trade, construction and manufacturing. Closure of several coal mines has been the main cause of loss of jobs in the

mining sector in Carbon County (BLM, 2003a, pg. 3-48). Trona and coal mining, as well as natural gas development, are significant employers in Sweetwater County (Sweetwater Economic Development Association, 2004, online data). Sweetwater County ranks third among Wyoming counties in 2000 coal production with 9.96 million tons produced. In 2000, Carbon and Sweetwater counties ranked fourth and sixth in the state in numbers of APDs filed with the Oil and Gas Conservation Commission, and ranked third and seventh in gas production (BLM, 2002a).

Median household income in 2000 was \$36,060 and \$46,537 in Carbon and Sweetwater counties, respectively. These levels represent 91.9 percent and 118.6 percent of the Wyoming statewide median income. The levels rank Carbon and Sweetwater counties tenth and fifth, respectively, among the 23 counties in Wyoming (WDAI, 2004, online data). The median value of owner-occupied housing units in 2000 was \$76,500 and \$104,200, respectively, for Carbon and Sweetwater counties (WDOE, 2004, online data). There were 8,380 and 16,053 housing units, respectively, in Carbon and Sweetwater counties in 2002 (U.S. Census Bureau, 2004, online data).

3.12.3 Local Government Revenues

A summary of county revenues is indicated in Table 3.11.

Table 3.12 County Revenues, Carbon and Sweetwater Counties, 2003.

| Revenue Source | Carbon County FY 2003 | Sweetwater County FY 2003 |
|-----------------------|----------------------------------|--------------------------------------|
| Property taxes | 24,595,682 | 78,174,590 |
| Sales taxes | 13,245,550 | 52,141,752 |
| Use taxes | 1,277,668 | 8,422,017 |
| Retail Taxes | 4,700,804 | 17,543,954 |

Source: WDAI (2004), Wyoming Taxpayers Association (2003)

3.12.4 Environmental Justice

Executive Order 12898 directs federal agencies to address disproportionately high or adverse effects to human health and environment on minority or low income populations. For Carbon County, 9.8 percent of families and 12.9 percent of individuals earned incomes placing them at poverty levels in 1999. For Sweetwater County, the poverty numbers in 1999 were 5.4 percent of families and 7.8 percent of individuals, respectively. This compares to numbers for the State of Wyoming of 8.0 percent of families and 11.4 percent of individuals in poverty in 1999. Carbon County thus has somewhat higher and Sweetwater County somewhat lower poverty levels than the state as a whole.

As discussed above, ethnic minorities make up a small portion of the population in both counties and in the State of Wyoming.

3.13 TRANSPORTATION

Primary access to the WDNGDP is provided by a combination of Interstate Highway (I-80), county, and BLM improved and unimproved roads. Main routes to the Project Area are the county-maintained, dirt-surfaced Bar-X Road and Tipton Road, both of which exit I-80 west of west of Wamsutter, Wyoming. Both roads travel north to the county-maintained, dirt-surfaced Luman Road. From the Bar-X Road intersection with the Luman Road, travel east to the Tipton-North Road. Turn north on the Tipton-North Road, RD 67 toward Hay Reservoir and fork to the right onto BLM Road 3219 to the Project Area. The Tipton Road route from I-80 intersects the Luman Road, west on Luman to the Tipton-North Road, RD 67 and north to BLM RD 3219.

Traffic to and from the area stems mostly from oil and gas-related activity and livestock management. Supplies used for drilling and construction will likely be transported by truck to the site from supply centers in Rock Springs, Rawlins, and Casper, Wyoming. All materials and equipment would be packaged, loaded, and transported per state (Wyoming Public Utilities Commission) and federal (DOT) requirements.

The BLM requires all roads on BLM-administered lands be designed and constructed or reconstructed to minimum standards per BLM Manual Section 9113. Existing roads in the Project Area are maintained in compliance with BLM standards.

3.14 HEALTH AND SAFETY

Current activities and conditions potentially contributing to the health and safety of individuals working or recreating in the Project Area include:

- ⊄ occupational hazards associated with oil and gas drilling and field operations,
- ⊄ risks associated with vehicle operations on improved and unimproved county and BLM roads and potential for vehicle collisions with big game species,
- ⊄ hunting related firearm-related accidents, and
- ⊄ natural hazards such as flash floods and range fires.

3.15 NOISE

Sources of noise in the Project Area, other than those associated with natural sources such as wind and storms, would include vehicular traffic on local, county and BLM roads, temporary oil and gas maintenance and repair operations, and overhead aircraft passage. In general, day and night noise levels in the area would compare to typical levels representative of a rural environment with the absence of any noise generating facilities in the Project Area.